



## COURTYARD OASES

ECOLOGY AT THE HEART OF THE SCHOOL.

By Sharon Gamson Danks

Sand, clay and straw squish between the toes of the cheerful 7th and 8th graders as they knead an adobe-like mixture into a building material called cob. Handfuls of the muddy substance are slapped onto a structure that has been growing for several months. Bare hands, knees, elbows, and feet are used to shape the emerging bench into a seating area for fifteen students—complete with squirrel and bird nesting holes carved into the back and sides. A bubbling stream can be heard nearby. Jays, towhees, and flickers call from the adjacent trees and shrubs, a squirrel scampers through the undergrowth and butterflies feed on the inviting flowers.

This lively, seemingly rural scene is not out in the secluded countryside—it's at the heart of Rowe Middle School in Milwaukie, Oregon, in its well-designed central courtyard.

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*"It is nice to be able to go outside and work with plants and nature, instead of getting all of our information from a textbook... This is a good class for kids especially if they like getting dirty and they have a lot of energy."*

—7th grade student

When students look out the windows of most elementary, middle and high schools today they see asphalt playgrounds and paved staff parking lots. Yet school grounds can be places of wonder, filled with exciting things to study, play with and explore. In short, they can be "ecological schoolyards" that speak to the local environment and teach students about sustainability, food production, resource conservation and ecological design.

In the past five to ten years, many K-12 schools around the United States have started ecology-related projects on their campuses, such as gardens and wildlife habitats (see "Ecological Schoolyards," *Landscape Architecture*, November 2000, and "Mind Games," January 2001). The most space for these projects is generally found around the outside of the buildings, adjacent to existing playgrounds. However, interior courtyards, if available, should not be





*A student gets her hands dirty at the minifarm at LeConte Elementary School in Berkeley, California.*

overlooked as potential sites for ecological enhancement. Courtyards are usually quiet places, protected from noisy playgrounds and nearby streets. They are also very visible internal spaces that can frequently be seen and enjoyed from the surrounding hallways and classroom windows.

Over the past three years I have visited approximately 90 schools with ecology-related projects on their grounds in the western United States, Canada and parts of northern Europe. My research has focused on the design of ecological schoolyards, their curriculum connections and the factors that make these projects successful. This article highlights three case studies from schools I have visited that are doing exceptional, but very different, types of work in enriching the educational, ecological and aesthetic value of their school courtyards.

## COURTYARD MINIFARM AND GARDEN

### LECONTE ELEMENTARY SCHOOL BERKELEY, CALIFORNIA

When the students at LeConte Elementary School step from the hallway into their school's courtyard they are transported from urban Berkeley into a mini-farm approximately 125 feet long and 30 feet wide, filled with a wide variety of seasonal vegetables, herbs, fruits and flowers. The mini-farm is also currently home to two free-range chickens and six rabbits. Over the years, it has also housed a variety of goats and ducks.

Founded in 1982, the Farm and Garden program at LeConte is one of the oldest school gardens in California. The program's goal is to connect Berkeley's urban children to the land by giving them a taste of what it is like to grow some of their own food and care for small farm animals. The project also seeks to improve the children's nutrition and to teach them about natural systems such as plant growth cycles and composting processes. The program is

currently managed by Ben Goff, the school's full-time Farm and Garden Instructional Specialist.

The courtyard is oriented along an east-west axis that helps to make its microclimate 15 to 20 degrees Fahrenheit warmer than the surrounding neighborhood and extends the warm growing season by several weeks. In addition, the concrete walls of the surrounding two-story building are painted a light color, reflecting additional light into the partly shaded courtyard, further improving plant growth. These physical conditions make it possible to raise long-season plants like Israeli musk melons, coax twelve-foot-tall sunflowers from the soil and grow tomatoes until December in Berkeley's otherwise moderate, somewhat foggy climate.

The courtyard's long, narrow garden covers an area approximately 60 feet by 15 feet. To protect the children and the animals, and to teach the students about organic agriculture, no chemical pesticides, herbicides, or fertilizers are used in the garden. Crops are rotated on an informal basis. Winter cover crops and loads of compost—produced in the garden—are used to enrich the soil. The courtyard includes several compost piles and worm compost bins that process plant waste from the garden, vegetable scraps from cooking classes and rich droppings from the chickens and rabbits. Pest control is taken care of by the courtyard's two chickens which devour all of the slugs, snails and insects they find.

The garden beds are not subdivided by classroom, so all students work on the whole space and think of the entire garden as "theirs." Tomatoes are some of the most popular items and include heirloom varieties such as green zebra, Russian black krim, big rainbow and a small orange cherry tomato variety called 'Allen Chadwick.' In cooler weather, the garden is also used to grow multiple varieties of lettuce and other crops such as garlic, onions, beets and turnips. Students sometimes harvest the lettuce and prepare it themselves for the school's salad bar. LeConte's cooking



*Farmer Ben teaches a lesson about the anatomy and physiology of plants by offering students a taste of fresh vegetables that represent each plant component.*



*Crops partially conceal a small mural in LeConte's courtyard minifarm (left). A wooden gate frames the garden's entrance (right).*

classes also use small quantities of other vegetables from the garden when they are in season. When school is not in session during the summer and holidays, Goff maintains the garden and helps to look after the animals with the assistance of other teachers, students and parents.

The garden's crops are watered using drip hoses arranged on the surface of the beds. Many crops, including tomatoes, are watered minimally for part of the growing season. "Farmer Ben," as he is called by the children, says this limited watering method makes the tomatoes taste better as well.

The ground in the courtyard is covered with wood chips, supplied at no cost by the City of Berkeley. Wood chips have been very successful in this context because they are low maintenance and help to keep the children's shoes free of mud. The chips also improve the courtyard's drainage as the additional organic matter absorbs much of the water. New chips are added once or twice a year as the old ones break down.

The courtyard's Rabbitry, founded in 2001, is presently home to six rabbits of the Dutch and Jersey Wooly varieties, chosen for their child-friendly characteristics, varied colors and small size. The rabbit hutches are located along the shady wall of the courtyard, and have been designed with wire mesh floors to allow the nutrient-rich droppings to fall directly into the worm compost bins below. The rabbits are taken care of by the school's 4-H Rabbit Raising Group under the direction of science teacher Betsy Sako. The third-to fifth-grade students in the group attended an 18-week 4-H course to learn about rabbit behavior and care. The students have already displayed their rabbits in two local county fairs and have won awards for their fine furry friends. In addition

to teaching the students the basics of animal husbandry, the rabbit program increases their knowledge of health and nutrition concepts. For example, raising the rabbits teaches the children about disease prevention and visibly illustrates the value of a good, balanced diet in producing a glossy coat.

Students visit the Farm and Garden once every two weeks for an hour-long class in groups of 10 to 14. Goff has done a wonderful job connecting the children's time in the garden to the curriculum and to nutrition education goals established by the California Nutrition Network, one of the garden's funders. A portion of each garden lesson includes a "tasting" of fresh organic fruits or vegetables, frequently grown on site. Such tasting opportunities encourage the children to try a wider variety of foods. For example, on my recent visit to the Farm and Garden, students enjoyed comparing the sweetness of two different varieties of heirloom tomatoes they helped to grow.

In addition to the tastings, students in kindergarten through third grade have formal lessons connected to California science standards and other topics they are studying in the classroom. They also participate in hands-on garden work such as planting seeds or composting. The garden-savvy fourth and fifth graders use their Farm and Garden time to practice more formal writing and observation skills using garden journals, and also participate in tasting sessions and hands-on garden activities.

Overall, the Farm and Garden at LeConte Elementary School successfully introduces urban children to experiences that are typically rural within a context they understand, learn from and enjoy.



## COURTYARD NATURESCAPE

ROWE MIDDLE SCHOOL  
MILWAUKIE, OREGON

At the heart of Rowe Middle School sits the courtyard “Naturescape,” a haven for wildlife and students. Visible from a main hallway, the library and many classrooms, the courtyard has been transformed from a simple, unused patch of lawn with a single tree into a vibrant, hands-on learning environment. The space is now a microcosm of the nearby rich forest ecosystem and a demonstration site for sustainable building materials and techniques.

Rowe’s long, narrow courtyard is approximately 190 feet long and 50 feet wide. It is surrounded on three sides by a one-story building, and on the fourth side by an 8-foot tall cement wall. The courtyard is oriented roughly east-west, so the space receives sunlight throughout the day.

Students have been actively involved in all aspects of the courtyard’s transformation, led by their dedicated art and ecology teacher, David Lochtie, and other school and community volunteers. More than 600 students have participated in the design, construction and maintenance of the Naturescape since the project began in 1996. For example, during the initial design phase, science classes conducted a baseline study of the limited plant and wildlife diversity on the site in order to document potential changes over time. Math classes measured the courtyard and made gridded, scaled maps of the available space. Landscape architects Gretchen Vadnais and Michael O’Brien helped the art classes use these maps to draw design ideas for the future Naturescape. Landscape architect Robert Marshal, then selected the best ten designs and helped the students refine their ideas into a single landscape plan. To explain their ideas to the school community, students built a clay model of the plan. Master gardener Rene Barron helped the



*Students at Rowe Middle School enjoy their “Diversity Bench.”  
Photograph by David Lochtie.*

ecology class to select native plants for the project, modeled on the forest of Oregon’s Willamette Valley, with attention to the needs of local wildlife.

Once construction started, students built a winding path through the courtyard with the help of AmeriCorps volunteers. Using recycled concrete slabs to add additional mass to the hills, students added compost to the soil and built berms for their plants to grow on. With the assistance of eco-builder Marna Hauk, art and ecology students later designed and built a beautiful cob bench with a living moss-covered roof, supported by tree branches. Technology classes constructed a picnic table out of recycled plastic lumber, and ecology classes built a number of bird houses and feeders. More than 100 students made artistic tiles to cover the Naturescape’s entrance arch.

The students in Lochtie’s popular Naturescape class are the courtyard’s stewards, responsible for ongoing maintenance tasks each semester. The most intensive work is concentrated in the early fall because the courtyard is left to take care of itself over the summer. During the school year, classes come out several times a week to keep the Naturescape looking tidy, embellish existing structures and dream up new things to add to the maturing landscape. Their coursework for the Naturescape class also covers topics ranging from native plant identification to ethnobotany, entymology and global warming.

Over the past six years, the Naturescape class has built something new in the courtyard each semester. Some of the projects improve outdoor seating and work areas, whereas others enhance the wildlife habitat value of the site, or emphasize other ecological systems such as energy or water flows. All of the projects use environmentally-friendly materials because the students pride themselves on making the courtyard a showcase for reused, recycled and natural materials. In addition, the students have chosen to exclusively use hand labor and hand tools for all of their



*The courtyard naturescape at Rowe Middle School after a light winter rainstorm.*

construction needs so as to conserve energy and avoid fossil fuels.

Some of the projects the students have built include a solar-powered recirculating stream and pond; raised beds made from recycled plastic lumber; a hand-tiled birdbath made from recycled cement and broken ceramics; a domed greenhouse constructed from fallen tree branches and recycled plastic sheeting; a large “Diversity Bench,” crafted from the branches of twenty different kinds of trees; and many other sculptural elements. The students are presently hard at work building a snaking 22-foot long table out of local red cedar and scraps of plywood discarded from a nearby construction site. The legs along one side of the table will extend upward to hold birdhouses and feeders.

The Naturescape is a certified National Wildlife Federation Schoolyard Wildlife Habitat, and provides food and water sources, habitat cover and places to nest for local wildlife species. Eight types of birds have been seen in the courtyard to date: jays, towhees, chickadees, flickers, mallard ducks, starlings, crows and cedar waxwings. The courtyard is also visited by small creatures such as butterflies and squirrels, and is home to frogs, mosquito fish and a garden snake that have been introduced to the space by the students.

Overall, Rowe Middle School’s courtyard Naturescape has successfully brought a piece of Oregon’s Willamette Valley forest into the school in a manner that is beautiful, educational and useful to local wildlife. The students involved in this project fully understand the ecological cycles in their midst and learn about ecological design through its direct application to their own learning environment.

## COURTYARD GREENING

PERALTA ELEMENTARY SCHOOL  
OAKLAND, CALIFORNIA

The 40-foot by 40-foot courtyard at Peralta Elementary School in urban Oakland, California, is a lush garden of flowering plants enjoyed by butterflies and local birds as well as the school community. Unlike the two examples discussed above, however, Peralta’s courtyard was paved in the 1980s to cut maintenance costs. A concrete sidewalk runs around the courtyard’s covered perimeter, and the center portion is paved with asphalt.

In the last four years, the space has been substantially transformed using a tall jungle of young trees and flowering plants arranged in clusters of large and small containers. First-grade teacher Calvert Hand spearheads the project and is assisted by other school staff members, students and a very active parent group. Colorful Japanese maples (*Acer palmatum*) and Chinese tallow trees (*Sapium sebiferum*)

## COURTYARD ECOLOGY DESIGN CONSIDERATIONS

Each project site presents its own opportunities and challenges, but there are a special set of design considerations that most courtyard ecology projects have in common. The factors mentioned below are a few things landscape architects should address before undertaking this type of work.

### ESTABLISH A MAINTENANCE PLAN

School courtyards are generally visible from many of the surrounding windows, classrooms and hallways. For this reason, beautification efforts, wildlife habitats, gardens and other projects can be observed by many people throughout the day. This is generally a good thing, because it keeps the project at “center stage” but it also means that the space should be kept well maintained to maximize enjoyment of the site and minimize conflicts with the school’s administration. As with any schoolyard project, a maintenance plan should be established before the project is built.

### DESIGN FOR APPROPRIATE ACCESS

Access to courtyard projects is usually easy to regulate because they are surrounded by the building’s walls. Ideally, schools should try to allow students to have access to courtyard projects throughout the day as well as during formal classroom lessons to maximize their interaction with the enhanced space. Unlike other school ground ecology projects, courtyards are generally closed to students and community members when school is not in session. This is unfortunate because it limits the impact the site can have, to some extent, but can also be useful for deterring vandalism. If the project contains expensive or delicate elements, such as solar panels or live animals, access can be regulated or monitored as needed.

### DESIGN FOR NOISE CONTROL

Courtyards are generally quiet spaces, protected from outside disturbances by the building’s thick walls. It is important to remember, though, that noise generated by students in the courtyard can carry into surrounding classrooms. For this reason, plan the locations of courtyard seating areas and other noisy activity centers away from any sensitive surrounding rooms. Noise can also be controlled effectively through the use of a “behavior policy” that asks students to refrain from shouting while in the courtyard.



structure the vegetation grouping and give it sufficient height to tower over the children's heads. Penstemons, buddleia, salvia varieties and other flowering plants draw butterflies and hummingbirds to the site. Geraniums, petunias, zinnias, marigolds, alyssum, lobelia, cosmos and impatiens add bright seasonal color and variety to the garden. Strawberry plants, tucked in among the flowers, help to draw the children into the space.

This brightly flowering courtyard garden has been enhanced with additional year-round color from two impressive artistic installations. With the help of artist Jamie Morgan, parents painted the courtyard's floor green several years ago. Morgan then assisted the children in painting leaf fossil designs, connected to their classroom studies, on the ground. Two years ago, Morgan also helped the students create an exuberant, multi-colored, three dimensional mural on an entire wall of the courtyard. Playful images of school scenes and nature, designed and painted by the children, bring the space to life.

Rustic benches, made of rough-hewn redwood logs donated by a community member, are arranged around the courtyard for casual seating. The space also includes an umbrella-covered table with log seats that provides a shady place for small groups to sit and is the perfect location for messy lessons and painting projects.

The courtyard garden is used for formal classroom lessons and as an informal meeting place. For example, kindergarten classes connect their insect and butterfly lessons to the creatures they find in the garden. Some of the butterflies they have seen there include monarchs, painted ladies and western ladies. First grade classes observe the hummingbirds, sparrows and other birds that visit the garden. To attract more birds, they have also contributed

handmade bird feeders and milk-carton bird houses. Parents of the younger students are often seen lingering in the courtyard over their morning cup of coffee after they have dropped their children off at school. At recess time, many children choose to come to the courtyard to socialize quietly with their friends or to write in their garden journals.

The flower garden at Peralta Elementary beautifies the school, successfully attracts wildlife and functions well as a gathering place for formal and informal activities. The lush container garden is an excellent "urban greening" model for others to follow, particularly in cases where it is not feasible or desirable to permanently remove the pavement from a school courtyard.

## COURTYARD POTENTIAL

Overall, courtyard ecology projects are ideal places for vegetable and flower gardens, habitats for some types of wildlife, homes for small farm animals, locations for solar panels and other small scale energy projects, water systems such as wetlands and ponds and small scale composting and material-reuse projects. They are also well suited for visual enhancement of the school environment, quiet single classroom activities and small group and individual projects.

Landscape architects can play a vital role in encouraging schools to use their campuses more effectively, both in newly built schools and by retrofitting existing school campuses. We can encourage schools to include vibrant ecological classrooms in their courtyards and in other places around their grounds. We can also be facilitators of public design processes that tailor the ecological design of such places to fit the needs of the individual schools and their curriculums.



At Peralta Elementary School, potted plants and a vibrant mural enliven a paved courtyard and logs provide seating.

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*For more information, please visit Green Schoolyards America at [www.greenschoolyardsamerica.org](http://www.greenschoolyardsamerica.org).*

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